Missouri Department of Natural Resources

Total Maximum Daily Load Information Sheet

Big Bottom Creek

Waterbody Segment at a Glance:

County: Ste. Genevieve
Nearby Cities: Rocky Ridge
Length of impairment: 0.5 miles
Pollutants: Biochemical Oxygen Demand (BOD) and Volatile Suspended Solids (VSS)
Source: Lake Forest Subdivision


State map showing location of watershed

TMDL Priority Ranking: High

Description of the Problem

Beneficial uses of Big Bottom Creek

- Livestock and Wildlife Watering
- Protection of Warm Water Aquatic Life
- Protection of Human Health associated with Fish Consumption

Use that is impaired

- Protection of Warm Water Aquatic Life

Standards that apply

- The Missouri Water Quality Standard (WQS), found in 10 CSR 20-7.031 Table A, for dissolved oxygen (related to BOD) in streams is 5.0 milligrams per liter (mg/L), or the natural dissolved oxygen profile of the stream, whichever is less.
- The standards for volatile suspended solids (VSS) may be found in the general criteria section of the WQS at 10 CSR 20-7.031(3)(A) and (C). Here it states:
  - Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses.
  - Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses.

Background Information and Water Quality Data

Any waterbody that was listed for Non-filterable Residue (NFR) in 1998, such as Big Bottom Creek, is now being listed for Volatile Suspended Solids (VSS). This change was made to better distinguish between organic solids coming from wastewater treatment plants (VSS) and mineral

solids (soil or mineral particles) coming from soil erosion or erosion of mine waste materials or stockpiles (Non-Volatile Suspended Solids or NVSS).

The Department of Natural Resources has made visual inspections of Big Bottom Creek below the Lake Forest Estates Subdivision wastewater treatment plant (WWTP) twice during summer low flow conditions during the past seven years. These inspections have shown a scarcity of aquatic life. In addition, almost all of the life forms that are present are tolerant of pollution. These conditions are characteristic of streams suffering from pollution from wastewater (or organic pollution). Wastewater high in Biochemical Oxygen Demand (BOD) reduces the amount of dissolved oxygen (DO) in the stream's water. Most aquatic organisms require high levels of oxygen to survive. In addition, VSS (suspended algae and sewage sludge) can settle onto the bottom of a stream and smother natural substrates (materials in the streambed), aquatic invertebrate animals (like crayfish and water insects) and fish eggs. In 2004, the department conducted water chemistry monitoring. The data are listed in the table below.

Like all wastewater discharges in Missouri, the Lake Forest WWTP has to meet the requirements of a discharge permit issued by the department. To correct the problems mentioned above, changes have been made to the discharge permit that will improve the quality of the wastewater discharge and result in improved water quality in Big Bottom Creek. The WWTP was upgraded in 2003 to meet these new permit limits and went online December 2004.

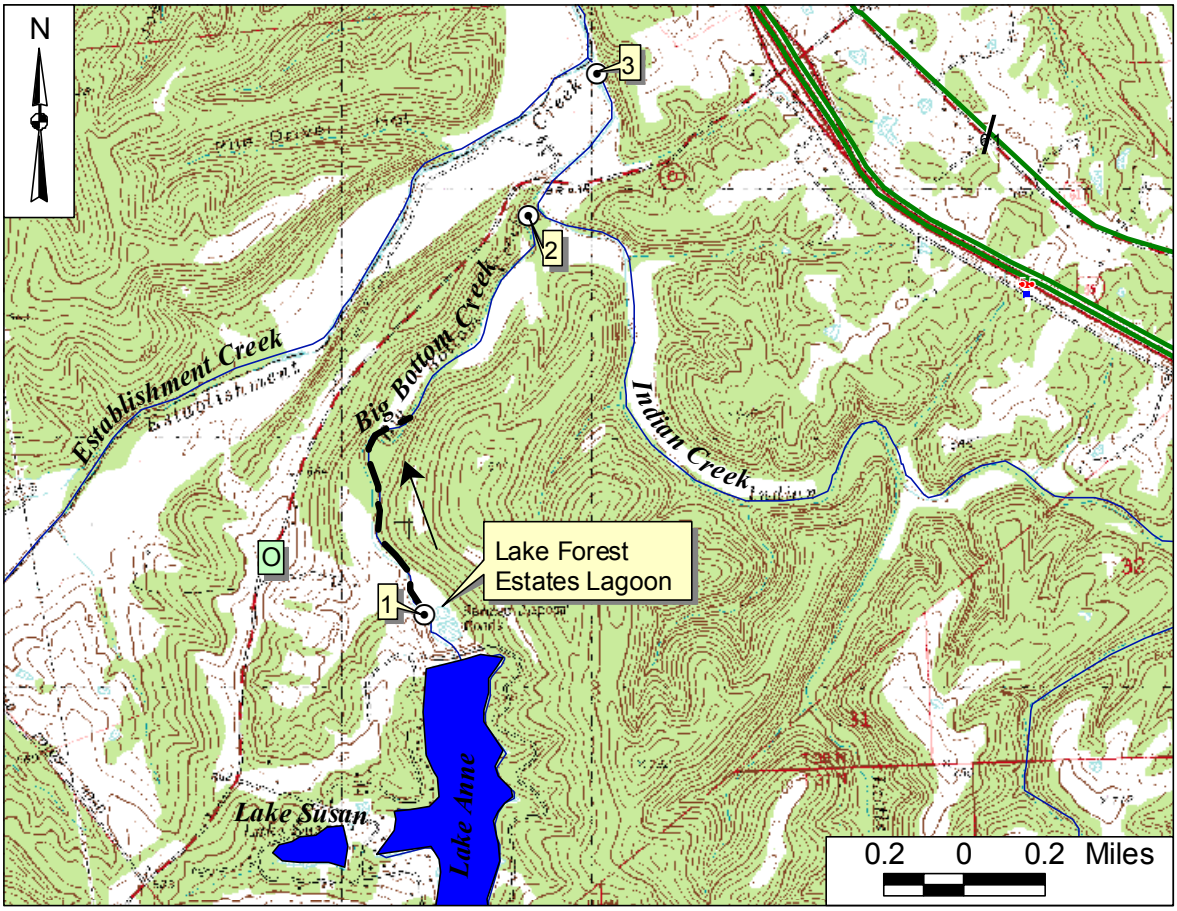
2004 Data for Big Bottom Creek – Lake Forest Lagoon

Site #	Site Name	Year	Mo	Day	Time	Flow	C	DO	TSS	BOD	CBOD
3	Big Bottom Cr. near Mouth	2004	7	1	1320	0.25	23	7.4			0.99
3	Big Bottom Cr. near Mouth	2004	7	2	610	0.25	22	4.4			0.99
2	Big Bottom Cr. just above Indian Cr.	2004	7	1	1250	0.05	18	4.7			0.99
2	Big Bottom Cr. just above Indian Cr.	2004	7	2	546	0.03	17	4.2			0.99
	Big Bottom Cr. just ab. Lake Forest Lgn.	2004	6	9				5.7	5	2	
1	Big Bottom Cr. just bl. Lake Forest Lgn.	2004	6	9				4.8	14	9.1	
1	Big Bottom Cr. just bl. Lake Forest Lgn.	2004	7	1	1210	0.2	26	4.4			3.17
1	Big Bottom Cr. just bl. Lake Forest Lgn.	2004	7	2	636	0.2	24	1.1			2.91
	Lake Forest Lagoon Effluent	2004	6	9				6.4	24	14.4	

Key to acronyms: Mo=Month; Flow in cubic feet pr second; C=Temperature in degrees Celsius; TSS=Total Suspended Solids in mg/L; CBOD=Carbonaceous Biochemical Oxygen Demand in mg/L

A map with the sample sites is on the next page.

Big Bottom Creek near Rocky Ridge, Ste. Genevieve County, Missouri, Showing Impaired Segment and Sample Sites



Impaired Segment Direction of Flow

For more information call or write:
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